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ABSTRACT

Academic and nonacademic variables that may predict persistence in the nursing program at Lakeland Community College, Ohio, were studied. The academic variables included American College Testing program standard scores, National League for Nursing (NLN) rank scores, high school grade point average, and previous college grade point average. The nonacademic variables included marital status, sex, admission pattern, age, prior nursing type experience, study habits, attitudes, and interests. Student records were analyzed for 251 former Lakeland students who entered in 1974, 1975, 1976, and 1977 and either graduated or withdrew from the nursing program by June 1979. Additionally, 672 students who had entered the Lakeland program during the fall of 1970 or later were sent a mail quesionnaire, and 232 replied. It was found that persisters ranked significantly higher on NLN examination's composite, reading comprehension, and social studies sections, and they tended to have significantly higher high school grade point averages than the nonpersisters. Additionally, persisters in the nursing program were more likely to be older females, who had delayed their entry from high school and had some practical licensed nursing experience prior to admission. These persisters were willing to deal with the everyday demands of education and were knowledgeable of the job opportunities in nursing. The noncompletors were younger, perhaps motivated by an idealistic conception of serving humanity, and less committed to the rigors of the education necessary to achieve their goals. (SW)

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Academic and Nonacademic Characteristics as Predictors of Persistence in an Associate Degree Nursing Program

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Mary Corcoran
University of Minnesota
(Editor, AIR Forum Publications)

Abstract

Both academic (quantitative measures such as ACT scores and grade point average) and nonacademic (geographical characteristics and attitudinal measures) variables have been studied as predictors of persistence in selective admissions programs.

This study examines some of the variables in relationship to the nursing program at Lakeland Community College where the attrition rate since 1970 has averaged 30 to 40 percent per class. The academic variables considered include ACT standard scores, NLN rank scores, high school GPA, and previous college GPA. The nonacademic variables include, marital status, sex, admission pattern, age, prior nursing type experience, study habits, attitudes, and interests.

Consistent with other recent studies, select academic variables proved predictors of persistency. Specifically in Lakeland's case, NLN scores and high school GPA were statistically significant. Some nonacademic variables were also important predictors for Lakeland. They were age, previous nursing experience, and a realistic commitment to "get through" as indicated by attitude responses, interests, and skills.

Problem Statement

The question of whom to admit to medical schools, universities, colleges, nursing programs, adult education programs, vocational secondary schools, and the like, and what criteria to use in the selection process has long been argued in academic circles, and as the recent Bakke case has shown, even in the courts.

Whenever there are more applicants than there are positions available, and when a selection process is used to determine which applicants will be selected and which will be rejected, various criteria come into play. Ideally, the criteria should help distinguish between those persons who persist, become academically successful, and subsequently vocationally successful, and those who do not.

The problem of student failures and dropouts pervades all sorts of academic systems, and the professional (lay as well) publications have extensively alluded to the alarming dropout rate in education. In her doctoral dissertation, Voss (1956) expressed the concerns of many individuals on matters of student success and failure when she stated, "The problem of prediction of success exists in all types of educational institutions at all levels. Not only is it of concern to admission committees, but it is important to the administration and faculty of the institution as well as to the student and his family."(p. 1) For the twenty some years since Voss made that statement, forecasting student success or failure has continued to be of intense interest.

The need to forecast student success and persistence in nursing schools has been described for many years. J. R. Thurston (1961) noted more than 15 years ago that about one-third of the students who enter nursing schools do not graduate, and this rate has held for many years. In

referring to a 1963 Surgeon General's report, Thurston also pointed out that there had been no thorough studies of the attrition problem since 1947, and that it seemed to reflect the position that a nursing student attrition rate of one-third was as inescapable as "death and taxes." The American Nurses' Association (1966) reported that in 1964 the overall attrition rate from junior college nursing programs was 29 percent. Levitt (1971) revealed that the attrition rate of nursing students is presently estimated at about one-third of all students admitted to all types of nursing programs.

The latest figures on nursing education from the National League for Nursing's annual survey (1978) of state approved schools of nursing included the following data: The number of graduates in the 1976-77 academic year for two-year associate degree programs was 36,815. The numbers admitted two years prior (1974-75) was 50,180. This reflects an attrition rate of 37 percent. Similar calculations based on appropriate data show a percent of 37 for diploma schools and a percent of 38 for baccalaureate degree institutions.

Lakeland Community College, in Kirtland, Ohio, has a similar problem. It has principally served students from Lake County, eastern Cuyahoga County, and to a lesser extent several other adjacent counties. In 1968, a two-year associate degree nursing program was initiated, and over the years, the enrollment of nursing students increased. In recent years, the number of students admitted into the nursing program has been approximately 100 per year while those requesting admission each fall was nearly 600 students. This meant, of course, that for each student admitted, five were rejected. One question raised each year by Lakeland's selection committee was, "how do we know that we have chosen the most promising 100 applicants?"

Their doubts were well justified. For each class, some 30 to 40 percent of the students failed to complete Lakeland's two-year nursing program. The mean attrition rate for Lakeland nursing students from 1968 to the summer of 1979 was 36 percent.

Lakeland Community College has used four criteria to determine who should be admitted into its associate degree nursing program. These are: the ACT composite score, previous college grade point average, high school grade point average, and the National League for Nursing Pre-Nursing and Guidance Examination's composite rank. With an attrition rate of over 30 percent and six applicants for every position, Lakeland's nursing faculty and admission committee felt that the present selection procedure had to be improved.

Review of Literature

Studies of nursing students attrition over the last 20 years have identified two types of explanatory variables: academic and nonacademic. The following is a summary of some of the more important studies concerned with both types of variables.

Significant differences were reported by Thurston, Brunclik, and Feldhusen (1968) between high achievers and low achievers or failures in nursing programs in terms of scores on the Pre-Nursing Guidance Examination and rank in high school graduating class. Halpin, Halpin, and Hauf (1976) reported that high school grade point average and ACT subtest scores were significantly related to nursing school grade point averages.

The importance of ACT scores was stressed again by other investigators. Montgomery and Palmer (1976) found that for associate degree nursing students, the average ACT scores between those who successfully completed a

fundamental nursing course was nearly five points higher than those who did not. The age of the student was significantly related to successful or unsuccessful completion of the course.

One of the noteworthy studies to include some nonacademic variables was conducted by Carlson (1967). He found that age, SCAT-VERBAL, prenursing courses, and high school chemistry were predictors of success on State Board Examinations and that nursing grades showed low to moderate correlation. Apparently unrelated to success were personal data, high school grades (except science), and quantitative ability.

Two other landmark studies stressed the importance of nonacademic variables. Pittman (1976) found students who were more adequately informed about the role of nursing prior to admission were more likely to succeed. (This included those who were previously employed in nursing settings, practical nurses, and those who had received good counseling.) In a later study Moore (1977) investigated among other things the relationship of selected scholastic, career, vocational, personality factors, and student characteristics to attrition. He found that in four-year universities, nursing program persisters and nonpersisters differed significantly on certain scores of the Scholastic Aptitude Test, Strong-Campbell Interest Inventory, and the Omnibus Personality Inventory. The author concluded that the findings did show scholastic interest, vocational interest, and personality factors could predict completion of an associate degree nursing program. Students below the age of 20 were found to be prone to failure.

In summary, while there appears to be growing agreement on the fact that both academic and nonacademic factors might be used as success predictors of persistence in associate degree nursing programs, there is, with perhaps the exception of age and prior nursing related experience,

little consensus on what these specific variables might be and the reasons for their effectiveness.

The Study

Hoping to shed more light on the attrition problem, we initiated, in the summer of 1979, a study of the background and performance of Lakeland Community College nursing students. This study was confined to students in the program from 1970 through 1979, excluding those admitted in 1978, since their completion or noncompletion was as yet unknown.

Lakeland Community College has an open admission policy, but admission into its nursing program is selective. As indicated earlier, the selection criteria included high school and previous college grade point averages and composite scores on the ACT and the NLN examinations.

Once admitted to the program, the student takes 18 months of nursing courses, including three courses in basic nursing and three courses in advanced nursing. The nursing courses cover content required by the Ohio State Board of Nursing and topics customarily found on the State Board Test Pool Examination.

In addition to the 59 quarter-hours of nursing courses, students must complete 51 quarter-hours of other courses required for the associate degree.

Approximately 97 percent of the nursing students are white. The mean average age at admission is about 25. About 9 percent of the students are male and nearly 45 percent are married.

Academic dismissal results from accumulating a below "C" overall average or a below "C" average in science courses or obtaining more than one "D" in the nursing courses.

Methodology

Data concerning the nursing students in the study came from two sources: college record files and a mail questionnaire. Those students for whom college record information was available composed one sample consisting of 251 former Lakeland students who entered in 1974, 1975, 1976, and 1977 and either graduated or withdrew from the nursing program by June, 1979. A second sample consisted of 672 students who were sent the mail questionnaire. They were former students who had entered the Lakeland program during the fall of 1970 or later and had graduated or withdrawn by June, 1979. While the two samples shared some common students, they were two distinct groups.

According to Lakeland's Director of Nursing, the admission requirements from 1970 to 1979 have remained essentially unchanged. Also, her observations have led her to believe that the students in the 1974, 1975, 1976, and 1977 classes were not unlike the students of the previous four years. Based on unchanged entrance requirements and the Director's opinions on the nature of the two samples, it was assumed that the two samples of Lakeland students were essentially alike. In addition, differences between persisters (graduates of nursing program) and nonpersisters (those who withdraw or are dropped from the program) in such characteristics as age, marital status, and final Lakeland College grade point average were essentially similar for both samples.

As indicated, data were obtained from two sources: (1) the student record file, and (2) a pencil and paper mailed questionnaire. Academic data were derived largely from the record file from such items as high school transcripts, college transcripts, ACT Assessment reports, and the National League for Nursing examination reports. Transcripts from high

school provided the high school grade point average and rank in graduating class. Transcripts from colleges provided the college grade point average. The ACT Assessment report provided the following information: English standard score, mathematics standard score, social science standard score, natural science standard score, and composite standard scores. The National League for Nursing examination report provided the following information: total academic aptitude percentile rank, reading comprehension percentile rank, science percentile rank, social studies percentile rank, and composite rank.

A limited amount of nonacademic data was available in the record file. This included the application form information (student's age, county of residence, sex, marital status, and whether the student had just completed high school or had applied on a delayed basis from high school), college transcripts with information on whether the student had had previous college work, and high school transcripts indicating the size of the students graduation class.

The bulk of nonacademic information was obtained from the mail questionnaire. This included interest, skill, biographical, attitudinal, and demographic information.

With regard to questionnaire development, conferences were held with three second-year Lakeland nursing students. Each student was asked to suggest reasons to account for the fact that some students were able to complete the nursing program whereas others were not.

A visit to Lake County Hospital to interview four graduates of the Lakeland Nursing Programs was made. Each graduate was asked to identify those traits which probably enabled some students to graduate and those traits which probably kept some students from completing the program.

Meetings were held with two former Lakeland nursing students who had dropped from the nursing program. Each was asked to give possible reasons why some students were unable to complete the program.

Discussions with two nursing instructors were held. Each person expressed her opinion on why students were or were not able to complete the nursing program.

The literature was examined for studies on the performance of nursing students in associate degree, baccalaureate degree, and diploma institutions. Research on success in licensed practial nursing programs was reviewed. Reasons for student attrition in colleges, adult education programs, and high schools, which were reported in the literature were noted.

Based on the above interviews and review of the literature, 88 items which contained the factors that seemingly could be associated with attrition in the Lakeland Nursing Program were constructed. With the assistance and coaching of an experienced and skilled questionnaire writer, the 38 items were transformed into 84 items which could be answered using a Likert type scale. Parallelism, crispness, and clarity were emphasized.

The 84 items were submitted to fifteen "experts" at Lakeland for evaluation. Each item was rated on a basis of one to five, five being best, to indicate the extent that each item would differentiate between persisters and nonpersisters. The experts included the dean of students, the director of nursing, two directors of admission, two educational psychologists, three counselors, and six nursing instructors. Thirteen reports were returned.

Based on the assessment of the thirteen reports and modifications offered by the respondents, the preliminary form of the questionnarie which consisted of 32 items was constructed.

The questionnaire was given to six first-year nursing students, after which each was asked to comment on its clarity and ambiguities. An English instructor reviewed the questionnaire. The comments from the six students and the instructor were considered in the development of the final form of the questionnaire.

Results of the Study

The record analysis sample consisted of 251 former Lakeland students while the questionnaire was mailed to 672 students (467 persisters and 205 nonpersisters) of which 232 replied, producing a return rate of approximately 35 percent.

With respect to the academic variables in the record file student sample, t-tests were computed to determine whether persisters could be significantly differentiated from nonpersisters in their scores on the selected variables. The results found in Tables 1 and 2 point out that persisters ranked significantly higher on NLN examination's composite, reading comprehension, and social studies sections. They also tended to have significantly higher high school grade point averages than the nonpersisters.

Tables 3 and 4 summarize the nonacademic variables derived from the record analysis. The statistically significant results (based on Chi-Square analysis) can be summarized as follows:

> persisters in the nursing program were more likely to be older females, who had delayed their entry from high school and had some practical licensed nursing experience prior to admission.

An elaboration of the interval level variables examined in the record sample can be found in Table 5. It contains the results of a stepwise multiple regression procedure relating student's final cumulative Lakeland grade point average with 12 selected predictor variables.

The first predictor variable entered, age of admission, explained 53.49 percent of the variance in the final cumulative Lakeland grade point average. When non-Lakeland average was added to age, 75.22 percent of the variance was accounted for. The addition of the third variable, ACT composite, made only a modest contribution. Beyond this point, the addition of each of the next nine variables added only slightly to the explained variance.

Table 6 summarizes the statistically significant different attitudes of former Lakeland nursing students in the questionnaire sample to their educational situation and environment as they recalled them at the time they entered the program. The responses were to a series of Likert-type items contained on the mail questionnaire. The following statements summarize the differences between persisters and nonpersisters.

> PROGRAM PERSISTERS were significantly different in their greater perseverance, initiative, desire to overcome barriers, and have satisfying relationships with their peers.
>
> PROGRAM PERSISTERS were more likely to have gone into nursing because of job availability. Their parents valued intellectual achievement and showed an interest in their high school activities.
>
> PROGRAM NONPERSISTERS were significantly different from persisters in their having chosen nursing because of an opportunity to serve humanity and realize a lifetime ambition. Finances were a strong reason for nonpersisters leaving the program. In general, their study habits were poorer than persisters including cramming for exams and greater difficulty paying attention in class.

Discussion

It is worth noting that two of the four criteria used by Lakeland as admission criteria (NLN composite rank and high school GPA) held up in this study as significant direct predictors of program persistence.

Certain nonacademic variables also appear to have significant predictive value. Older students with a view of nursing grounded in reality were more

likely to finish the program. This grounding in reality included some practical nursing experience, a willingness to deal with the everyday demands of education, and a motivation linked to a knowledge of the job opportunities in nursing.

The noncompletors were younger, perhaps motivated by an idealistic conception of serving humanity, and less committed to the rigors of the education necessary to achieve their goals.

The importance of age and practical nursing experience have been well documented in studies already referred to [Carlson (1967), Montgomery (1976), Price (1976), Moses (1977)]. What is truly noteworthy is the appearance of an idealistic-realistic dichotomy distinguishing nonpersisters from persisters. This distinction was also found in Howard Becker's classic study of the medical students at the University of Kansas Boys in White: Student Culture in Medical School (1961). He noted that the medical students who completed the program temporarily put aside their idealism in favor of the practical concern of "getting through."

> We believe that medical students enter medical school openly idealistic about the practice of medicine and the medical profession. They do not lose this idealistic language perspective but realistically develop a "cynical" concern with the day-to-day details of getting through medical school (p. 422).

The questionnaire portion of this work partly suffers from a modest return rate and a dependence on past recollections of respondents. While the later problems may be difficult to overcome, the former could be improved in follow-up studies.

Dispite these drawbacks, the results appear consistent with other recent works, while supporting the use of some nonacademic variables as success predictors.

This study clearly points to the need for Lakeland's admission committee to reexamine its present selection criteria. Two of the four academic variables presently used fail to significantly differentiate persisters from nonpersisters, and no nonacademic predictor variables are presently used.

The work has broader implications. Its results make it easier to identify potential noncompleters already in the program and to initiate needed help.

TABLE 1

Means and Standard Deviations of the Academic-Intellectual Variables Used by the Lakeland Selection Committee to Determine Admission into the Nursing Program

Predictor Variables	Criterion Variable: Persisters N	Persisters Mean	Persisters SD	Nonpersisters N	Nonpersisters Mean	Nonpersisters SD	Mean Diff.	t-Value	Sig. Level
ACT Composite Score	86	19.27	4.50	28	18.54	3.41	0.73	0.79	0.432
NLN Composite Rank	140	62.71	62.71	33	52.76	22.81	9.95	2.13	0.034
Previous College GPA	85	2.73	0.66	14	2.37	0.50	0.36	1.93	0.056
High School GPA	165	2.83	0.66	42	2.53	0.62	0.80	2.78	0.006

TABLE 2

Means and Standard Deviations of Selected Academic-Intellectual Variables for Persisters and Nonpersisters

Predictor Variables	Criterion Variable: Persisters N	Persisters Mean	Persisters SD	Nonpersisters N	Nonpersisters Mean	Nonpersisters SD	Mean Diff.	t-Value	Sig. Level
NLN Examination Rank									
Reading Comprehension	138	66.10	27.26	33	48.58	23.66	17.52	3.40	0.001
Science	138	62.46	25.28	33	55.27	27.46	7.19	1.44	0.151
Social Studies	138	65.56	26.76	33	48.55	27.71	17.01	3.26	0.001
Total Aptitude	138	59.41	25.27	33	51.88	21.20	7.53	1.58	0.115
ACT Assessment Scores									
English	83	19.06	4.16	28	17.86	3.90	1.20	1.34	0.182
Mathematics	83	17.06	6.47	28	15.75	5.69	1.31	0.95	0.342
Social Studies	83	18.81	6.29	28	18.64	5.42	1.70	0.12	0.902
Natural Science	83	21.69	5.14	28	21.50	4.73	0.19	0.17	0.866
High School Rank	144	36.94	26.10	37	48.38	25.87	11.44	-2.38	0.018

TABLE 3

Frequencies and Percentages of Persisters and Nonpersisters with Respect to Selected Nonacademic-Nonintellectual Variables

Predictor Variables	Criterion Variable: Persisters N	Persisters f	Persisters %	Nonpersisters N	Nonpersisters f	Nonpersisters %	Chi-Square	Degrees Freedom	Sig. Level
Marital Status	194			50			3.38	1	0.10
Married		102	52.58		19	38.00			
Single		92	47.42		31	62.00			
Sex	197			51			5.35	1	0.05
Male		14	7.11		9	17.65			
Female		183	92.89		42	82.35			
Admission Pattern	192			51			5.28	1	0.05
Direct from H.S.		19	9.74		11	21.57			
Delayed from H.S.		176	90.26		40	78.43			
County of Residence	196			49			4.53	2	0.20
Lake		133	67.86		38	77.55			
Cuyahoga		39	19.90		10	20.41			
Other		24	12.24		1	2.04			
Attended College Prior to Lakeland	194			50			2.09	1	0.20
Yes		88	45.36		17	34.00			
No		106	54.64		33	66.00			
Age Range	197			51			5.47	1	0.02
0 - 19		36	18.27		17	33.33			
20 or more		161	81.73		34	66.67			

TABLE 4

Frequencies and Percentages of Persisters and Nonpersisters Who Were licensed practical nurses, and Frequencies and Percentages of Persisters and Nonpersisters Who Had Professional Hospital, Clinical, or Medical Experience Prior to Admission to Lakeland's Nursing Program

Predictor Variables		Criterion Variable (N=173) Persisters Yes	No	(N=57) Nonpersisters Yes	No	Chi-Square	Degrees Freedom	Sig. Level
Licensed Practical Nurse prior to Admission	f	27	146	3	54	4.04	1	0.05
	%	15.61	84.39	5.26	94.74			
Professional Experience: Hospital, Clinical Medical Experience prior to Admission	f	79	95	23	34	0.44	1	0.30
	%	45.40	54.60	40.35	59.65			

TABLE 5

Summary of Stepwise Multiple Regression Analysis Showing Proportions of Variance, R^2, in Final Cumulative Lakeland Grade Point Average Explained by Predictor Variables From Student Record File.

Step	Predictor Variable Enterd	R^2
1.	Age at Admission	0.5349
2.	Non-Lakeland College Grade Point Average	0.7522
3.	ACT Composite	0.8081
4.	NLN Academic Aptitude	0.8229
5.	ACT Social Studies	0.8309
6.	NLN Reading Comprehension	0.8329
7.	High School Grade Point Average	0.8440
8.	NLN Composite	0.8483
9.	NLN Science	0.8551
10.	NLN Social Studies	0.8912
11.	Rank in High School	0.9009
12.	ACT English	0.9032

TABLE 6

Frequency of Persister's and Nonpersisters' Responses to Selected Predictor Variables Appearing on Author's Questionnaire

Predictor Variables	Criterion Variable		Likert Scale-Frequencies of Responses				Chi-Squares	Degrees Freedom	Sig. Level
		N	St. Dis.	Dis.	Agree	St. Agree			
I had perserverence.	Item 3*	Persisters	174	2	2	76	94	44.67	3	0.001
		Nonpersisters	57	2	2	28	13			
I had initiative.	Item 4*	Persisters	174	1	4	93	76	24.45	3	0.001
		Nonpersisters	57	0	11	33	13			
Having begun a difficult task, I finished despite most barriers.	Item 6*	Persisters	173	2	7	108	56	20.60	3	0.001
		Nonpersisters	57	2	12	34	9			
My social interactions with my peers were satisfying.	Item 9*	Persisters	174	4	13	124	33	9.32	3	0.030
		Nonpersisters	57	1	12	38	6			
At the time I applied to Lakeland's nursing program, my desire to become a nurse was strong.	Item 11*	Persisters	173	8	19	74	72	10.23	3	0.020
		Nonpersisters	56	0	3	17	36			

Table 6 (contd)

Predictor Variables	Criterion Variable		Likert Scale-Frequencies of Responses				Chi-Squares	Degrees Freedom	Sig. Level
		N	St. Dis.	Dis.	Agree	St. Agree			
One major reason for having chosen nursing career is job availability.	Item 12*	Persisters	174	20	48	81	25	8.84	3	0.030
		Nonpersisters	56	14	19	17	6			
I had conflicts about my commitment to an education that were difficulty for me to resolve.	Item 13*	Persisters	174	51	92	22	9	44.04	3	0.001
		Nonpersisters	57	5	20	31	1			
If nursing training turned out to be different from the ideas that I had about the program, I would drop from the program.	Item 14*	Persisters	171	40	91	35	5	9.32	3	0.030
		Nonpersisters	57	4	33	19	1			
The major reason for my Having chosen a nursing career was the opportunity to serve humanity.	Item 15*	Persisters	172	6	38	91	37	18.35	3	0.001
		Nonpersisters	57	0	2	30	25			
I was interested in nursing most of my life.	Item 16*	Persisters	173	23	55	56	39	18.00	3	0.001
		Nonpersisters	57	1	19	10	27			
If finances were to have become difficult, I would not continue in the program.	Item 17*	Persisters	172	30	103	31	8	28.71	3	0.001
		Nonpersisters	56	4	18	25	9			

Table 6 (contd)

Predictor Variables	Criterion Variable		Likert Scale-Frequencies of Responses				Chi-Squares	Degrees Freedom	Sig. Level
		N	St. Dis.	Dis.	Agree	St. Agree			
I had a good relationship with my father.	Item 20*	Persisters	170	10	32	75	53	13.45	3	0.010
		Nonpersisters	56	1	3	21	31			
In my home, intellectual achievement was valued.	Item 21*	Persisters	171	4	18	88	61	21.46	3	0.001
		Nonpersisters	57	0	20	27	10			
My parent(s) showed an interest in high school activities.	Item 22*	Persisters	169	8	34	83	44	7.84	3	0.050
		Nonpersisters	57	2	22	21	12			
When I read assignments, I tried to associate new ideas with those I already knew.	Item 24*	Persisters	172	2	23	122	25	14.17	3	0.010
		Nonpersisters	57	1	20	32	4			
I crammed for tests.	Item 27*	Persisters	169	19	58	69	23	19.66	3	0.002
		Nonpersisters	67	0	8	39	10			
I had difficulty paying attention in classes.	Item 29*	Persisters	172	46	114	10	2	57.69	3	0.001
		Nonpersisters	57	7	21	19	10			

*Note: Starred items significant at or beyond the .050 level.

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